Reconstructing ice sheet fluctuation in Skarvesnes, southern part of Soya Coast, East Antarctica

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Geomorphological studies in Antarctica are important to understand past fluctuation of the Antarctic Ice Sheet, which is essential to evaluate the stability of ice sheet and to anticipate their contribution to future sea level rise. Recent studies have reported a retreat ages of the ice sheet based on surface exposure dating (SED) in Skarvsnes, southern part of Soya Coast, East Antarctica (Yamane et al, 2011). However, the past thickness and retreat processes of the ice sheet remain unclear, because reported ages are only from four locations and the glacial retreat history was not well discussed. In this study, we reconstruct detail retreat history of the ice sheet at the Skarvsnes based on geomorphological field survey and systematically obtained SED samples for each difference altitude and distance from the current ice sheet margin. As a result of the field survey, the basement rocks at the top of 400 m altitude in Skarvsnes were weathered extensively, whereas weathering of the basement rocks below 250 m altitude were relatively weak. These differences indicate upper limit ice sheet height at LGM in Skarvsnes. Also, at the several points in Skarvsnes, two directions of glacial striations were found. From these field observations, the ice sheet elevation was declined and the flow direction was changed under the influence of the basement topographical roughness since the LGM in Skarvsnes. Surface exposure ages newly obtained from the three locations are consistent with these geomorphological considerations and it suggests that near current ice sheet edge has been exposed from ice about 9 ka. Consequently, the ice sheet retreat probably has already completed at the early Holocene in Skarvsnes. These data almost consistent with retreat ages at other regions in East Antarctica (Mackintosh et al. 2014).

References

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